



# NMDCAT

## FINAL SESSION PAPER-1

**Total MCOs: 200**

**Max. Marks: 200**

# BIOLOGY

- Q.1 The outermost boundary in most of the plant cells is:**  
a. Cell membrane  
b. Plasma-lemma  
c. Cell wall  
d. Tonoplast
- Q.2 The nuclei of both plant and animal cells contain one or more dense bodies known as nucleoli. Which one of the following correctly describes the function of nucleoli?**  
a. The formation of new DNA molecules  
b. The organization of the spindle during nuclear division  
c. The replication of mitochondria following nuclear division  
d. The formation of ribosomes
- Q.3 What is the function of the smooth endoplasmic reticulum in eukaryotic cells?**  
a. Aerobic respiration  
b. Intercellular digestion  
c. Synthesis of steroids  
d. Synthesis and transport of proteins
- Q.4 Phagocytosis is the common character of:**  
a. Bacterial cells  
b. Plant cells  
c. Animal cells  
d. Fungal cells
- Q.5 Identify the precise difference between mitochondria and chloroplast:**  
a. ATP is synthesized only in mitochondria  
b. DNA is found only in chloroplasts  
c. Small 70S ribosomes are only found in chloroplasts  
d. NADP is found only in chloroplasts
- Q.6 A tadpole's tail is gradually broken down during metamorphosis into an adult frog. Which organelle increases in number in the cells of the tail at this time?**  
a. Centriole  
b. Endoplasmic reticulum  
c. Golgi apparatus  
d. Lysosome
- Q.7 During the formation of one molecule of sucrose, a water molecule is released which takes its 'OH' group from:**  
a. Maltose  
b. Galactose  
c. Fructose  
d. Glucose
- Q.8 Which bond is the potential source of chemical energy for cellular activities?**  
a. C-N  
b. C-O  
c. C-H  
d. H-O
- Q.9 The number of peptide bonds formed and water molecules released during formation of 100 amino acids containing single chain protein will be:**
- |    | No. of Peptide Bonds Formed | No. of Water Molecules Released |
|----|-----------------------------|---------------------------------|
| a. | 100                         | 100                             |
| b. | 99                          | 99                              |
| c. | 99                          | 100                             |
| d. | 100                         | 99                              |
- Q.10 The final structure of a single beta chain of haemoglobin is:**  
a. Primary  
b. Tertiary  
c. Secondary  
d. Quaternary
- Q.11 Myosin tail is a \_\_\_\_\_ type of protein.**  
a. Intermediate  
b. Simple  
c. Globular  
d. Fibrous
- Q.12 Which one of the following pyrimidine base is absent in DNA?**  
a. Uracil  
b. Thymine  
c. Cytosine  
d. Adenine

	No. of Peptide Bonds Formed	No. of Water Molecules Released
a.	100	100
b.	99	99
c.	99	100
d.	100	99



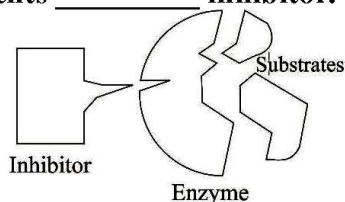
**Q.13** It is a unifying feature of all the co-factors used by various enzymes in the cell:

- a. Organic in nature
- b. Inorganic in nature
- c. Protein
- d. Non-protein

**Q.14** At freezing point, the enzymes of human body may be:

- a. Ionized
- b. Denatured
- c. Saturated
- d. Inactivated

**Q.15** The following figure represents \_\_\_\_\_ inhibitor.



- a. Non-competitive
- b. Competitive
- c. Irreversible
- d. Isosteric

**Q.16** The first step of non-cyclic photophosphorylation is:

- a. Electron Transport Chain
- b. Photolysis
- c. Photo-excitation of electrons
- d. NADPH formation

**Q.17** How many G3P molecules are recycled to produce three molecules of RuBP during Calvin cycle?

- a. 1
- b. 3
- c. 15
- d. 5

**Q.18** The end product of preparatory phase of glycolysis during cellular respiration in human cells will be:

- a. Lactic Acid
- b. Alcohol
- c. Pyruvate
- d. G3P

**Q.19** In respiratory chain,  $\text{FADH}_2$  causes reduction of:

- a. Coenzyme Q
- b. Cytochrome c
- c. Cytochrome a
- d. Cytochrome b

**Q.20** These compounds commonly found in both mitochondria and chloroplast:

- a. Rubisco
- b. Cytochromes
- c. Chlorophylls
- d.  $\text{NADP}^+$  reductase

**Q.21** Which of the following types of mammalian cell does not carry out oxidative phosphorylation?

- a. Erythrocytes
- b. Oxyntic cell
- c. Neuron
- d. Cardiac muscle cell

**Q.22** The shape of HIV capsid is:

- a. Spherical
- b. Conical
- c. Square
- d. Polyhedral

**Q.23** It is a common attribute of all viruses:

- a. Contains both DNA and RNA
- b. Have common mode of transmission
- c. Obligate intra-cellular parasites
- d. Equipped with lipoprotein envelope

**Q.24** All of these are ways of transmission of HIV except:

- a. Blood
- b. Placenta
- c. Breast feeding
- d. Saliva

**Q.25** Cocci are mostly:

- a. Atrichous
- b. Lophotrichous
- c. Monotrichous
- d. Peritrichous

**Q.26** It is not present in cytoplasmic matrix of bacteria?

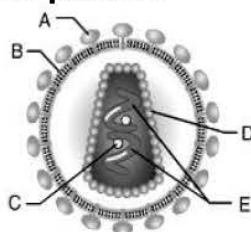
- a. Mesosomes
- b. Granules
- c. Ribosomes
- d. Microtubules

**Q.27** It is the most distinctive feature of the members belongs to kingdom fungi:

- a. Glycogen storage
- b. Conjugation
- c. Absence of centrioles
- d. Nuclear Mitosis



**Q.28** The diagram below shows an HIV particle:



\_\_\_\_\_ is made up of lipoproteins, while \_\_\_\_\_ is nucleic acid in nature, respectively.

- a. B, D  
c. A, B
- b. B, E  
d. D, E

**Q.29** \_\_\_\_\_ are a large group of parasitic protozoa.

- a. Amoebae  
c. Zooflagellates
- b. Apicomplexans  
d. Ciliates

**Q.30** The one which is non-vascular seedless plants is:

- a. Cooksonia  
c. Marchantia
- b. Lycopodium  
d. Adiantum

**Q.31** Pick odd one out regarding plants:

- a. Multicellular  
c. Photosynthetic
- b. Seedless or seed producing  
d. Unicellular sex organs

**Q.32** The phylum having largest biodiversity on earth is:

- a. Annelida  
c. Mollusca
- b. Chordata  
d. Arthropoda

**Q.33** If a plasmolyzed plant cell is placed in hypotonic solution it will:

- a. Turgid  
c. Shrink
- b. Burst  
d. Remain same

**Q.34** Which vein has oxygenated blood?

- a. Renal vein  
c. Pulmonary vein
- b. Subclavian vein  
d. Jugular vein

**Q.35** Right atrium is separated from right ventricle by:

- a. Tricuspid valve  
c. Semilunar valve
- b. Bicuspid valve  
d. Septum

**Q.36** In humans, the closed sac which surrounds the heart is:

- a. Endocardium  
c. Pericardium
- b. Myocardium  
d. Epicardium

**Q.37** Which of the following blood vessels contain semilunar valves?

- a. Arteries  
c. Arterioles
- b. Veins  
d. Capillaries

**Q.38** The lymphatic vessels of the body empty the lymph into blood stream at the:

- a. Abdominal vein  
c. Jugular vein
- b. Subclavian vein  
d. Bile duct

**Q.39** A person survived after Covid-19 may develop \_\_\_\_\_ immunity.

- a. Artificial Active  
c. Natural Active
- b. Artificial Passive  
d. Natural Passive

**Q.40** Antibodies are proteins and made up of how many polypeptide chains?

- a. One  
c. Three
- b. Two  
d. Four

**Q.41** What are three components of mechanism of homeostatic regulations?

- a. Receptors, control center and effectors  
c. CNS, PNS and diffused nervous system
- b. Sensory, motor and associative neurons  
d. Cerebrum, cerebellum and pons

**Q.42** Urination is controlled by sphincters present at junction of:

- a. Ureters and bladder  
c. Ureters and renal pelvis
- b. Urethra and bladder  
d. Collecting ducts and pelvis

**Q.43** All of the following are related to juxtamedullary nephrons except:

- a. Equipped with short loop of Henle  
c. Formation of concentration of urine
- b. Vasa Recta  
d. Presence of glomerulus in renal cortex





- Q.44** The site of the nephron which is specialized for maximum reabsorption of useful nutrients from the filtrate is:  
a. Descending limb  
b. Collecting duct  
c. Proximal convoluted tubule  
d. Ascending limb
- Q.45** Which of following is responsible for thermoregulation in humans?  
a. Hormone  
b. Skin  
c. Skeletal muscle  
d. All a, b, c
- Q.46** Most abundant type of muscles in human body are:  
a. Cardiac muscles  
b. Circular smooth muscles  
c. Longitudinal smooth muscles  
d. Skeletal muscles
- Q.47** Each dark band in skeletal muscles has lighter strip in its mid-section called:  
a. Z-line  
b. H-zone  
c. M-line  
d. I-band
- Q.48** Each muscle fiber is surrounded by a modified cell membrane called:  
a. Sarcolemma  
b. Sarcomere  
c. Myosin Filament  
d. Myofilament
- Q.49** Nociceptors are specialized for the detection of sense of:  
a. Deep pressure  
b. Touch  
c. Pain  
d. Vibration
- Q.50** Cell bodies of \_\_\_\_\_ neurons are always located inside the CNS.  
a. Sensory  
b. Motor  
c. Associative  
d. Afferent
- Q.51** How many  $\text{Na}^+$  are pumped out in response to two  $\text{K}^+$  transported into the nerve cell?  
a. 1  
b. 2  
c. 3  
d. 4
- Q.52** Find out the mismatched pair from the given options:  
a. Glucagon - Protein  
b. Oxytocin - Polypeptide  
c. ADH - Amino acid derivative  
d. Cortisone - Steroid
- Q.53** Which hormonal pair shares a common hypothalamic releasing factor?  
a. STH and LH  
b. ACTH and LH  
c. FSH and STH  
d. FSH and LH
- Q.54** The maximum thickness of uterus is attained during \_\_\_\_\_ phase.  
a. Menstrual  
b. Proliferative  
c. Secretory  
d. Menopause
- Q.55** Which of the following phases of ovarian and uterine cycle do not run in a parallel way?  
a. Follicular and Menstrual  
b. Follicular and proliferative  
c. Luteal and Secretory  
d. Follicular and Secretory
- Q.56** During menstrual cycle of 28 days, proliferative phase ends at:  
a. 13<sup>th</sup> day  
b. 15<sup>th</sup> day  
c. 27<sup>th</sup> day  
d. 21<sup>th</sup> day
- Q.57** How many phenotypes in *P. sativum* were studied by G. Mendel?  
a. 7  
b. 14  
c. 9  
d. 16
- Q.58** The combined probability of producing round and yellow seeds in dihybrid cross is:  
a. 3/16  
c. 1/16  
b. 9/16  
d. 1/4
- Q.59** If a hemophilic woman is married to a normal man, then they can have all except:  
a. Carrier daughter  
b. Heterozygous daughter  
c. Hemophilic son  
d. Normal son
- Q.60** How many round yellow seeds of  $F_2$  progeny were homozygous for both seed shape and color in dihybrid cross?  
a. 1/16  
b. 9/16  
c. 1/4  
d. 3/16
- Q.61** It is the mechanism that is responsible for the production of many different alleles of a gene:  
a. Gene linkage  
b. Gene duplication  
c. Gene mutation  
d. Gene splicing
- Q.62** The blood group alleles start their expression at:  
a. Time of birth  
b. Puberty  
c. Time of death  
d. Early embryonic life



- Q.63** In humans, the ABO blood group system is encoded by a single polymorphic gene which is located on:  
a. Autosome No. 4  
b. Autosome No. 7  
c. Autosome No. 9  
d. Autosome No. 19
- Q.64** The amount of DNA is fixed for a particular species as it depends upon:  
a. No of genes  
b. Amount of RNA  
c. No of chromosomes  
d. Size of cell
- Q.65** The DNA strand that is transcribed is called:  
a. Sense  
b. Coding  
c. Anti sense  
d. Complementary
- Q.66** All of the following are stop codons except:  
a. UAA  
b. UAG  
c. UGA  
d. AUG
- Q.67** Which of the following is constructed from 5' to 3'?  
a. Leading strand  
b. Lagging strand  
c. PCR products  
d. All a, b, c
- Q.68** Total number of nuclear codons that specifies amino acids are  
a. 45  
b. 170  
c. 61  
d. 64
- Q.69** Sickle cell Hb is the result of change in sequence of amino acids in:  
a. DNA  
b. One alpha chain  
c. One beta chain  
d. Both beta chains
- Q.70** S-type *Pneumococcus* are virulent due to presence of:  
a. Cell membrane  
b. Polysaccharide coat  
c. Cell wall  
d. All
- Q.71** In fishes the gill pouches develop into  
a. Gills  
b. Throat  
c. Eustachian tube  
d. Ear
- Q.72** Modern biological sciences suggest that \_\_\_\_\_ are the ancestors of all life.  
a. Protists  
b. Protozoans  
c. Prokaryotes  
d. Parazoans
- Q.73** Darwin's theory of evolution was mainly based on the evidences from:  
a. Geographical distribution and fossil record  
b. Fossil record and Embryology  
c. Geographical distribution and comparative anatomy  
d. Paleontology and Geology
- Q.74** \_\_\_\_\_ are used as important vectors in genetic engineering.  
a. Organoids  
b. Plasmids  
c. Nucleoids  
d. Mesosomes
- Q.75** Complementary DNA is produced by the action of \_\_\_\_\_ on RNA template.  
a. RNA polymerase  
b. Restriction endonuclease  
c. Reverse transcriptase  
d. DNA ligase
- Q.76** Which one of the following enzyme is temperature insensitive?  
a. DNA polymerase-I  
b. *Taq* polymerase  
c. DNA ligase  
d. RNA polymerase
- Q.77** It is an example of palindromic sequence:  
a. AGTC  
b. GGTA  
c. GCATGC  
d. AATTGC
- Q.78** During PCR, DNA strands are separated through:  
a. Helicase  
b. Primase  
c. Heat  
d. Chemically
- Q.79** Which one of the following is a correct sequence of PCR?  
a. Heating → Cooling → Add Primer → Copying of strand  
b. Heating → Add primer → Cooling → Copying of strand  
c. Add primer → Heating → Cooling → Copying of strand  
d. Cooling → Add primer → Heating → Copying of strand
- Q.80** The tiny and self-sealing holes in the protoplast can be generated through:  
a. Treatment by using chemicals  
b. Mechanical shaking  
c. Electric current  
d. Treatment with various enzymes



## CHEMISTRY

- Q.81** The limiting line of Balmer series lies in U.V region, while other lines fall in  
 a. Visible region  
 b. I.R region  
 c. U.V region  
 d. X-rays region
- Q.82** Which of the following is acidic buffer?  
 a.  $\text{NH}_4\text{OH} + \text{NH}_4\text{Cl}$   
 b.  $\text{HCl} + \text{NaCl}$   
 c.  $\text{CH}_3\text{COOH} + \text{CH}_3\text{COONa}$   
 d.  $\text{NH}_4\text{OH} + \text{HCl}$
- Q.83** Rate of zero order reaction \_\_\_\_\_  
 a. Depends on concentration of one reactant  
 b. Depends on concentration of two reactants  
 c. Depends on concentration of three reactants  
 d. Is independent of the initial concentration of reactants
- Q.84** A radioactive sample disintegrates 75% after 10 years. What will be the half-life of the sample?  
 a. 5 Years  
 b. 2 Years  
 c. 3 Years  
 d. 10 Years
- Q.85** The rate of reaction involving ions can be studied by  
 a. Dilatometric method  
 b. Electrical conductivity method  
 c. Spectrometry method  
 d. Differential method
- Q.86** When the change in concentration is  $6 \times 10^{-2} \text{ mol dm}^{-3}$  and time for that change is 100 seconds, the rate of reaction will be  
 a.  $6 \times 10^{-3} \text{ mol dm}^{-3} \text{ sec}^{-1}$   
 b.  $6 \times 10^{-2} \text{ mol dm}^{-3} \text{ sec}^{-1}$   
 c.  $6 \times 10^{-4} \text{ mol dm}^{-3} \text{ sec}^{-1}$   
 d.  $6 \times 10^{-5} \text{ mol dm}^{-3} \text{ sec}^{-1}$
- Q.87** Which of the following is correct about given reaction?  
 $\text{Mg (s)} + \frac{1}{2} \text{O}_2(\text{g}) \rightarrow \text{MgO (s)} \quad \Delta H = -692 \text{ kJ mol}^{-1}$   
 a. Enthalpy of formation  
 b. Enthalpy of lattice energy  
 c. Enthalpy of atomization  
 d. Enthalpy of ionization energy
- Q.88** Which of the following is endothermic?  
 a. Dissolution of  $\text{NH}_4\text{Cl}$  in water  
 b. Neutralization  
 c. Evaporation  
 d. Both a and c
- Q.89** Combustion of graphite to form  $\text{CO}_2$ , can be done by two ways. Reactions are given as follow  
 $\text{C} + \text{O}_2 \longrightarrow \text{CO}_2 \quad \Delta H = -393.7 \text{ kJ mol}^{-1}$   
 $\text{C} + \frac{1}{2} \text{O}_2 \longrightarrow \text{CO} \quad \Delta H_1 = ?$   
 $\text{CO} + \frac{1}{2} \text{O}_2 \longrightarrow \text{CO}_2 \quad \Delta H_2 = -283 \text{ kJ mol}^{-1}$   
 a.  $-676 \text{ kJ mol}^{-1}$   
 b.  $+110 \text{ kJ mol}^{-1}$   
 c.  $-110 \text{ kJ mol}^{-1}$   
 d.  $676 \text{ kJ mol}^{-1}$
- Q.90** Study the following reaction:  
 $8\text{H}^+ + \text{MnO}_4^- \rightarrow \text{Mn}^{+2} + 4\text{H}_2\text{O}$   
 Which statement is true about this reaction?  
 a. 5  $\text{e}^-$  are added in R.H.S  
 b. 3  $\text{e}^-$  are added in L.H.S  
 c. 3  $\text{e}^-$  are added in R.H.S  
 d. 5  $\text{e}^-$  are added in L.H.S
- Q.91** The  $E^\circ$  value of standard silver half-cell is 0.80V, measured when it is connected with SHE i.e. Standard hydrogen electrode. In this case the half reaction taking place at SHE is  
 a.  $2\text{H}^+_{(\text{aq})} + 2\text{e}^- \longrightarrow \text{H}_{2(\text{g})}$   
 b.  $\text{H}_{2(\text{g})} \longrightarrow 2\text{H}^+_{(\text{aq})} + 2\text{e}^-$   
 c.  $2\text{H}^+_{(\text{aq})} + 2\text{e}^- \longrightarrow 2\text{H}_{(\text{g})}$   
 d.  $\text{H}_{2(\text{g})} \longrightarrow 2\text{H}_{(\text{g})} + 2\text{e}^-$
- Q.92** Oxidation number of carbon in ethanol and glucose respectively is  
 a. +4, +4  
 b. -2, 0  
 c. 0, -2  
 d. -2, +4
- Q.93** Which of the following is correct order of electron affinity  
 a.  $\text{F} > \text{Cl} > \text{I}$   
 b.  $\text{Cl} > \text{I} > \text{F}$   
 c.  $\text{I} > \text{Cl} > \text{F}$   
 d.  $\text{Cl} > \text{F} > \text{I}$





- Q.94 Which of following is iso-structural pair**  
 a.  $\text{BF}_3$ ,  $\text{NH}_3$  c.  $\text{SO}_2$ ,  $\text{CO}_2$   
 b.  $\text{NH}_3$ ,  $\text{H}_3\text{O}^+$  d. All of these
- Q.95 Which of the following is more reactive metal?**  
 a. Mg b. Be  
 c. Li d. Na
- Q.96 Which of the following elements has highest melting point?**  
 a. Al b. S  
 c. Si d. P
- Q.97 Which of the following is the least reactive alkali metal?**  
 a. Rubidium c. Sodium  
 b. Potassium d. Cesium
- Q.98 The outer electronic configuration of an atom is  $18[\text{Ar}] 3d^8, 4s^2$ , the atom is**  
 a. Manganese b. Chromium  
 c. Iron d. Nickel
- Q.99 Which of the following transition metals ion does not show paramagnetic character?**  
 a.  $\text{Mn}^{2+}$  b.  $\text{Fe}^{3+}$   
 c.  $\text{Zn}^{2+}$  d.  $\text{Cr}^{3+}$
- Q.100 In the first transition series the general increase in binding energy ends at \_\_\_\_\_**  
 a. Copper b. Zinc  
 c. Scandium d. Vanadium
- Q.101 Ethyl ethanoate is functional group isomer of**  
 a. Butyric acid b. Butanone  
 c. 2-Hydroxy propanoic acid d. Methyl propanoate
- Q.102 The anthracene is an organic compound which is categorized under**  
 a. Alicyclic hydrocarbons b. Acyclic Hydrocarbons  
 c. Polycyclic hydrocarbons d. Heterocyclic hydrocarbons
- Q.103 The type of structural isomerism which arises due to the unequal distribution of carbon atoms on either side of the functional group is**  
 a. Chain isomerism b. Cis-Trans isomerism  
 c. Position isomerism d. Metamerism
- Q.104 When propene is treated with water in the presence of conc.  $\text{H}_2\text{SO}_4$  the final product will be**  
 a. 1-Propanol b. Ethyl hydrogen sulphate  
 c. 2-Propanol d. 2-Hydroxy propanoic acid
- Q.105  $\text{CH}_3\text{COOH} \longrightarrow \text{CH}_3\text{CH}_3 + 2\text{H}_2\text{O}$  which of following reagent is used for given conversion**  
 a.  $\text{NaBH}_4$  / Ether b.  $\text{H}_2$  / Ni  
 c.  $\text{LiAlH}_4$  / Ether d. HI / P
- Q.106 The secondary structure of protein is a regular coiling or zigzagging of polypeptide chains caused by hydrogen bonding between**  
 a. NH and  $\text{CH}_2$  b.  $\text{CH}_2$  and  $\text{CO}_2$   
 c. NH and  $\text{C=O}$  d. NH and OH
- Q.107 Many enzymes contain a protein part and non-protein part. The protein part is known as**  
 a. Co-enzyme b. Co-factor  
 c. Apo-enzyme d. Both a and b
- Q.108 The enzymatic reaction occurs best at or around \_\_\_\_\_**  
 a. 0 Kelvin b. 37 Kelvin  
 c. 298 Kelvin d. 310 Kelvin
- Q.109 The  $e/m$  value of positive rays is minimum for**  
 a. Helium b. Nitrogen  
 c. Oxygen d. Hydrogen
- Q.110 When 50 g lime stone ( $\text{CaCO}_3$ ) is heated then 21 g CaO is formed. What is %age yield of given reaction  $\text{CaCO}_3 \longrightarrow \text{CaO} + \text{CO}_2$**   
 a. 42 % b. 70 %  
 c. 75 % d. 99 %



- Q.111** With decrease in the value of principal quantum number 'n' the shape of the s – orbitals remain same although their sizes
- Decrease
  - Remain the same
  - Increase
  - May or may not remain the same
- Q.112** Total number of carbon atoms present in 11g carbon dioxide (C=12, O = 16)
- $6.02 \times 10^{22}$
  - $6.02 \times 10^{23}$
  - $3.1 \times 10^{23}$
  - $1.5 \times 10^{23}$
- Q.113** The weight of a single molecule of oxygen gas is
- $5.32 \times 10^{-23}$ g
  - $5.32 \times 10^{23}$  g
  - $2.656 \times 10^{-23}$  g
  - 32 g
- Q.114** The formula used to find out the number of electrons in a shell is
- $n^2$
  - $2(2l + 1)$
  - $2 n^2$
  - $2l + 1$
- Q.115** Mathematically, Charle's law can be represented as
- $V \propto T$
  - $V_1 / T_1 = V_2 / T_2$
  - $V / T = K$
  - All of these
- Q.116** Which of the following gases has maximum root mean square velocity?
- CO<sub>2</sub>
  - O<sub>2</sub>
  - H<sub>2</sub>
  - N<sub>2</sub>
- Q.117** The chloroform (CHCl<sub>3</sub>) is miscible with acetone (CH<sub>3</sub>COCH<sub>3</sub>) due to
- Dipole-dipole forces
  - London dispersion forces
  - H-Bonding
  - Debye forces
- Q.118** Which of the following compounds has highest boiling point?
- Ammonia
  - Water
  - Hydrogen fluoride
  - Ethanol
- Q.119** Which one of the following is an example of non-polar molecular solid?
- Sodium chloride
  - Diamond
  - Dry ice
  - Sucrose
- Q.120** Sodium chloride in aqueous solution is conductor of electricity due to
- Free electrons
  - Free ions
  - Ionic bond
  - Free protons
- Q.121** The relationship between K<sub>p</sub> and K<sub>c</sub> for the following reaction is
- $$2\text{SO}_{2(g)} + \text{O}_{2(g)} \rightleftharpoons 2\text{SO}_{3(g)}$$
- $K_p = K_c (RT)^{1/2}$
  - $K_c = K_p (RT)^{1/2}$
  - $K_c = K_p (RT)$
  - $K_p = K_c (RT)$
- Q.122** Maximum yield of ammonia can be obtained during Haber's process by
- Continuous withdrawal of ammonia
  - Decreasing temperature
  - Increasing pressure
  - All of above
- Q.123** During the manufacture of SO<sub>3</sub>, Sulphur dioxide is oxidized to Sulphur trioxide. This reaction is given as
- $$2\text{SO}_{2(g)} + \text{O}_{2(g)} \rightleftharpoons 2\text{SO}_{3(g)} \quad \Delta H = -ve$$
- According to Le Chatelier's Principle**
- Reaction must not be temperature dependent
  - Reaction must be carried out at room temperature
  - Reaction must be carried out at low temperature
  - Reaction must be carried out at high temperature
- Q.124** Which one is correct order about 1<sup>st</sup> ionization energy
- P > S > Cl
  - Cl > P > S
  - S > Cl > P
  - Cl > S > F
- Q.125** Vicinal dihalide on treating with a strong base eliminates two molecules of hydrogen halides from two adjacent carbons to give an
- Alkane
  - Alkyne
  - Alkene
  - Arene





- Q.126** Ethanal is prepared by the hydration of ethyne through the formation of  
 a. Ethanol  
 b. Propen-1-ol  
 c. Propen-2-ol  
 d. Vinyl alcohol
- Q.127** Chlorination of benzene in the presence of  $\text{FeCl}_3$  gives the product  
 a. Chlorobenzene  
 b. 1,2,3,4,5,6-Hexachloro cyclohexane  
 c. Methylbenzene  
 d. Chloro cyclohexane
- Q.128** Among the following, the compound that can be most readily sulphonated is  
 a. Chlorobenzene  
 b. Benzene  
 c. Nitrobenzene  
 d. Toluene
- Q.129** Which of the following alkyne does not show acidic character?  
 a. 2-Butyne  
 b. Ethyne  
 c. 1-Butyne  
 d. Propyne
- Q.130** Iso-propyl chloride has following carbon attached to chloro group  
 a. Tertiary  
 b. Secondary  
 c. Quaternary  
 d. Primary
- Q.131** 2-Chloro-2-methyl propane undergoes reaction by  
 a.  $\text{S}_{\text{N}}1$  or  $\text{S}_{\text{N}}2$  mechanism  
 b. Neither  $\text{S}_{\text{N}}1$  nor  $\text{S}_{\text{N}}2$  mechanism  
 c.  $\text{S}_{\text{N}}1$  mechanism only  
 d.  $\text{S}_{\text{N}}2$  mechanism only
- Q.132** Consider the reaction given below:  

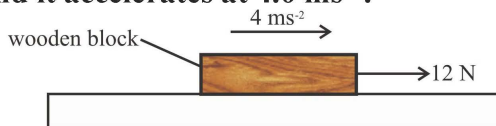
$$(\text{CH}_3)_3\text{CBr} \xrightarrow[\text{alcohol}]{\text{KOH}} (\text{CH}_3)_2\text{C}=\text{CH}_2 + \text{HBr}$$
  
 Mechanism followed by the reaction is:  
 a.  $\text{E}_2$   
 b.  $\text{S}_{\text{N}}1$   
 c.  $\text{E}_1$   
 d.  $\text{S}_{\text{N}}2$
- Q.133** The order of reactivity of alcohols when O-H bond breaks  
 a. Primary > secondary > tertiary  
 b. Secondary > tertiary > primary  
 c. Tertiary > Primary > secondary  
 d. Tertiary > secondary > primary
- Q.134** Picric acid is another name of  
 a. 2,4,6-Tribromophenol  
 b. 2,4,6-Trinitrotoluene  
 c. 2,4-Dinitrophenol  
 d. 2,4,6-Trinitrophenol
- Q.135** The reaction of ethanol with sodium metal is an example of \_\_\_\_\_ reaction  
 a. Nucleophilic substitution  
 b. Elimination  
 c. Electrophilic substitution  
 d. Electrophilic addition
- Q.136** Which of the following carbonyl compounds give positive iodoform test?  
 a. Propanal  
 b. Propanone  
 c. 3-Pentanone  
 d. Methanal
- Q.137** Reaction of aldehyde and ketone with ammonia derivatives is example of \_\_\_\_\_ reaction  
 a. Nucleophilic addition  
 b. Nucleophilic substitution  
 c. Addition- elimination  
 d. Aldol condensation
- Q.138** Sodium borohydride reduces \_\_\_\_\_ to secondary alcohol  
 a. Butene  
 b. Butyric acid  
 c. Butanal  
 d. Butanone
- Q.139** Oxidation of alkenes gives carboxylic acid in presence of \_\_\_\_\_  
 a. Hot acidified  $\text{KMnO}_4$  solution  
 b. Cold acidified  $\text{KMnO}_4$  solution  
 c.  $\text{LiAlH}_4$  solution  
 d.  $\text{NaBH}_4$  solution
- Q.140**  $\text{CH}_3\text{COOH} + \text{PCl}_5 \longrightarrow ?$  the final product (s) formed  
 a.  $\text{CH}_3\text{COCl} + \text{POCl}_3$   
 b.  $\text{CH}_3\text{COCl} + \text{POCl}_3 + \text{HCl}$   
 c.  $\text{CH}_3\text{COCl} + \text{H}_2\text{O} + \text{HCl}$   
 d.  $\text{CH}_3\text{COCl} + \text{H}_2\text{O} + \text{POCl}_3$

## PHYSICS

- Q.141** A bullet of mass 50 g is fired horizontally from a building 45 m high. It reaches ground after  
 a. 1s  
 b. 5s  
 c. 3s  
 d. 4s
- Q.142** When a meteorite enters the earth atmosphere, it catches fire. Where does its momentum go?  
 a. Its momentum destroyed  
 b. Changed into heat  
 c. Changed into light  
 d. Transferred to air molecules



- Q.143** A wooden block of mass 0.60 kg is on a rough horizontal surface. A force of 12 N is applied to the block and it accelerates at  $4.0 \text{ ms}^{-2}$ .



What is the magnitude of the frictional force acting on the block?

- a. 2.4 N  
b. 9.6 N  
c. 14 N  
d. 16 N
- Q.144** A particle moves along the x axis from  $x_i$  to  $x_f$ , which of the following values of the initial and final coordinates, which results in the displacement with the largest magnitude?
- a.  $x_i = 4\text{m}$ ,  $x_f = -2\text{m}$   
b.  $x_i = -4\text{m}$ ,  $x_f = 4\text{m}$   
c.  $x_i = 4\text{m}$ ,  $x_f = 6\text{m}$   
d.  $x_i = -4\text{m}$ ,  $x_f = -8\text{m}$
- Q.145** Slope of work time graph is equal to
- a. Force  
b. Power  
c. Velocity  
d. Energy
- Q.146** K.E of an object of 2kg having velocity  $(\cos\alpha + \sin\alpha) \text{ ms}^{-1}$  will be
- a. 2J  
b.  $(2\cos\alpha)\text{J}$   
c. 1J  
d.  $(2\sin\alpha)\text{J}$
- Q.147** Find the work required to lift a mass of 5 tones to a height of 30m. If this is done in 2 minutes, what power is being used?
- a. 12262 W  
b. 14000 W  
c. 11000 W  
d. 15000 W
- Q.148** A machine needed 1000 J of energy to raise a 10 Kg block at a distance of 6 m, what is machine efficiency
- a. 39 %  
b. 59%  
c. 49 %  
d. 100%
- Q.149** At what point or points in this vertical loop of string attached with a stone, revolves in a circle. Tension in a string has maximum value at
- 
- a. Point A  
b. Point B  
c. Point C  
d. Point D
- Q.150** A toy car moves around a circle of radius 0.3m at 2 revolution per second its angular speed is
- a.  $\pi \text{ rad/s}$   
b.  $2\pi \text{ rad/s}$   
c.  $4\pi \text{ rad/s}$   
d.  $8\pi \text{ rad/s}$
- Q.151** A particle is acted upon by a force of constant magnitude which is always perpendicular to the velocity of particle the motion of the particle takes place in a horizontal plane. It follows
- a. Linear momentum is constant  
b. It moves in a circular path  
c. Velocity is constant  
d. Particle move in straight line
- Q.152** In case of planets the necessary acceleration is provided by
- a. Gravitational force  
b. coulomb force  
c. frictional force  
d. centripetal force
- Q.153** When a wave goes from one medium to another medium, which one of the following characteristics of the wave remains constant
- a. Velocity  
b. Wavelength  
c. Frequency  
d. Phase
- Q.154** There is no net transfer of energy by particle of medium in
- a. Longitudinal wave  
b. Transverse wave  
c. Progressive wave  
d. Stationary wave



- Q.155** Product angular frequency and time period for an oscillator is  
 a. 1  
 b. 3  
 c. 6  
 d. Infinite
- Q.156** A wave generator produces 500 pulses in 10s. Find the frequency of pulse it produces  
 a. 50 pules  $s^{-1}$   
 b. 40 pules  $s^{-1}$   
 c. 20 pules  $s^{-1}$   
 d. 30 pules  $s^{-1}$
- Q.157** The thermodynamics process during which the volume of the system remains constant is called  
 a. Isothermal process  
 b. Isochoric process  
 c. Adiabatic process  
 d. Isobaric process
- Q.158** If amount of heat given to a system be 35J and then amount of work done by the system be +15J, then change in the internal energy of the system is:  
 a. -50J  
 b. +20J  
 c. -20J  
 d. 50J
- Q.159** If the time constant CR is small the capacitor will be charged or discharged  
 a. Slowly  
 b. Rapidly  
 c. Will not charge  
 d. Uniformly
- Q.160** A charge Q is divided into two parts q and Q-q and separated by a distance R. The force of repulsion between them will be maximum when:  
 a.  $q = \frac{Q}{4}$   
 b.  $q = \frac{Q}{2}$   
 c.  $q = Q$   
 d.  $q = \frac{Q}{3}$
- Q.161** A 5  $\mu F$  capacitor has a potential difference across its plates is 200 volts. The charge on the capacitor is  
 a.  $2.5 \times 10^{-8} C$   
 b.  $10^{-3} C$   
 c.  $10^3 C$   
 d.  $4 \times 10^3 C$
- Q.162** The energy stored per unit volume in an electric field of strength E volt/meter in a medium of dielectric constant K (in Joule/metre<sup>3</sup>) is:  
 a.  $\frac{1}{2} \epsilon_0 E^2$   
 b.  $\frac{1}{2} K \epsilon_0 E^2$   
 c.  $\frac{1}{2} \cdot \frac{\epsilon_0 E^2}{K}$   
 d.  $\frac{1}{2} K^2 \epsilon_0^2 E$
- Q.163** When a current of 1A flows for 5 sec through the lamp. How much charge flows through the lamp  
 a. 10C  
 b. 5C  
 c. 1C  
 d. Insufficient data
- Q.164** Three lamps of 100 W each are operated for 2 hours daily. Then energy consumed in one month will be  
 a. 1 kWh  
 b. 18 kWh  
 c. 6 kWh  
 d. 24 kWh
- Q.165** Circuit which gives continuously varying potential is called  
 a. Complex network  
 b. Wheat stone bridge  
 c. Potential divider  
 d. All of above
- Q.166** The power of two electric bulbs are 100 W and 200 W. Which are connected to the power supply of 220 V separately. The ratio of resistance of their filament will be  
 a. 1:2  
 b. 2:1  
 c. 1:3  
 d. 4:3
- Q.167** An electron is moving northward in a magnetic field directed vertically downward. The electron will be deflected.  
 a. Eastward  
 b. Westward  
 c. Vertically upward  
 d. Remain undeflected
- Q.168** An electron enters a region where the electric field E is perpendicular to the magnetic field B. It will suffer no deflection if  
 a.  $E = Bev$   
 b.  $B = eE/v$   
 c.  $E = Bv$   
 d.  $E = Bev/2$





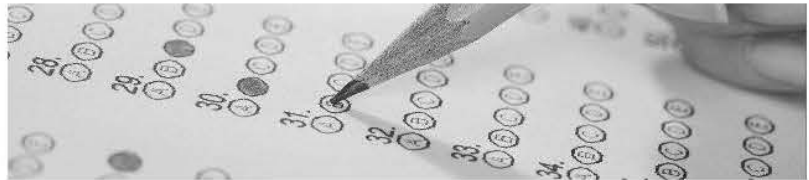
- Q.169 Eddy current is produced when**  
 a. A metal is kept in changing magnetic field      b. A metal is kept in steady magnetic field  
 c. A circular coil is placed in a steady magnetic field      d. A current is passed through a circular coil
- Q.170 In electromagnetic induction, the induced e.m.f. in a coil is independent of**  
 a. Resistance of the circuit      b. Time  
 c. Change in the flux      d. None
- Q.171 The north pole of a magnet is brought near a metallic ring. The direction of the induced current in the ring will be**  
 a. Clockwise      b. Anticlockwise  
 c. Towards north      d. Towards south
- Q.172 A coil having an area  $2\text{m}^2$  is placed in a magnetic field which changes from  $1\text{Wb/m}^2$  to  $4\text{Wb/m}^2$  in a interval of 2 second. The e.m.f. induced in the coil will be**  
 a. 3 V      b. 1.5V  
 c. 2 V      d. 4V
- Q.173 The method by which only one half of A.C cycle is converted into direct current is called**  
 a. Half wave amplification      b. Full wave rectification  
 c. Half wave rectification      d. Full wave amplification
- Q.174 In full wave rectification, the output D.C. voltage across the load is obtained for**  
 a. The positive half cycle of input A.C.      b. The complete cycle of input A.C.  
 c. The negative half cycle of input A.C.      d. All of the above
- Q.175 The kinetic energy of electron and proton is  $10^{-32}\text{J}$ . Then the relation between their de-Broglie wavelengths is**  
 a.  $\lambda_p = \lambda_e$       b.  $\lambda_p > \lambda_e$   
 c.  $\lambda_p < \lambda_e$       d.  $\lambda_p = 2\lambda_e$
- Q.176 The velocity of a particle of mass m of de-Broglie wavelength  $\lambda$  is \_\_\_\_\_**  
 a.  $\frac{2h}{m\lambda}$       b.  $\frac{m\lambda c^2}{h}$   
 c.  $2m\lambda c^2$       d.  $h/m\lambda$
- Q.177 The no of spectral lines in Balmer series**  
 a. 2      b. 5  
 c. 3      d. Infinite
- Q.178  $^{90}_{38}\text{Sr}$  decays to  $^{90}_{39}\text{Y}$  by**  
 a. Emission of  $\alpha$ -particles      b. Emission of  $\beta$ -particles  
 c. Emission of  $1\alpha$  and  $2\beta$  particles      d. Absorption of electrons
- Q.179 The radioactivity of a certain radioactive element drops to  $1/64$  of its initial value in 30 seconds. Its half-life is**  
 a. 4 seconds      b. 3 seconds  
 c. 5 seconds      d. 2 seconds
- Q.180 Gamma radiation are emitted due to**  
 a. De-excitation of atom      b. De-excitation of nucleus  
 c. Excitation of atom      d. Excitation of nucleus

## ENGLISH

### Directions:

In the following sentences, some segments of each sentence are underlined. Your task is to identify that underlined segment of the sentence, which contains the mistake that needs to be corrected.

- Q.181** Many instructors are of the opinion that athletics provides good recreation to everyone.  
 a.      b.      c.      d.
- Q.182** Improving democracy is about enhance the opportunities for people to make their own decisions.  
 a.      b.      c.      d.
- Q.183** If your friendship be genuine, based on loyalty and mutual affection, there is little which can  
 a.      b.      c.      d.  
 destroy it.



**Q.184** He hesitated to accept the post as he did not think the salary would be enough for the man with a family of ten.

a. b. c. d.

**Q.185** It is indeed commendable that the apex court has deemed it necessary to remind the government of its duties in promoting education and investing it.

a. b. c. d.

**Q.186 Who is creating this mess? Choose the correct Passive.**

- a. Who has created this mess?
- b. By whom has this mess been created?
- c. By whom this mess is being created?
- d. By whom is this mess being created?

**Q.187 The teacher said, "Be quiet, boys." Choose the correct indirect.**

- a. The teacher said that the boys should be quiet.
- b. The teacher called the boys and ordered them to the quiet.
- c. The teacher urged the boys to be quiet.
- d. The teacher commanded the boys that they be quiet.

**Directions:**

In each question in the following, four alternative sentences are given. Choose the CORRECT one and fill the circle corresponding to that letter in the answer sheet.

**Q.188**

- a. When consciousness returned this bewildered victim inquired, "Why sir, this cruel usage?"
- b. When consciousness returned, this bewildered victim inquired: "Why, sir, this cruel usage?"
- c. When consciousness returned, this bewildered victim inquired, "Why sir this cruel usage?"
- d. When consciousness returned this bewildered victim inquired: "Why, sir this cruel usage?"

**Q.189**

- a. No sooner did he collide with the glass window than it shattered and produced countless facets of light.
- b. No sooner did he collide with the glass window, it shattered and produced countless facets of light.
- c. No sooner did he collide with the glass window when it shattered and produced countless facets of light.
- d. No sooner he collided with the glass window than it shattered and produced countless facets of light.

**Q.190**

- a. Despite being tried his best to persuade people to give up smoking, he could not attain success.
- b. Despite of his best trying to persuade people to give up smoking, he could not attain success.
- c. Despite trying his best to persuade people to give up smoking, he could not attain success.
- d. In spite of being tried his best to persuade people to give up smoking, he could not attain success.

**Q.191 The same person who never had made a single mistake began straying from one Surah to another. The underlines clause is a/ an \_\_\_\_\_.**

- a. Noun clause
- b. Adjective clause
- c. Pronoun clause
- d. Adverb clause

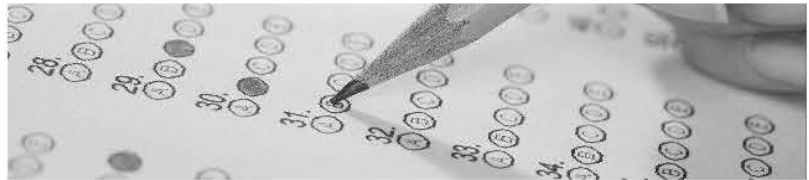
**Q.192 The owner of the shop, wearing a long robe and a silk turban, greeted him warmly. The underlines phrase is a/ an \_\_\_\_\_.**

- a. Participial phrase
- b. Gerund phrase
- c. Verb Phrase
- d. Adverb Phrase

**Q.193 I didn't see the film, nor did I have time to read the book. Identify the type of sentence.**

- a. Simple
- b. Compound
- c. Complex
- d. Compound Complex

**Q.194 Well, who would have thought it? Identify the Part of Speech of the underlined word.**



- a. Adverb
- c. Interjection

- b. Adjective
- d. Modifier

**Directions:**

Choose the right option to complete the following sentences.

**Q.195** We finished the report but forgot to turn it \_\_\_\_\_.

- a. Out
- b. Away
- c. In
- d. On

**Q.196** For businessmen, the question is all about \_\_\_\_\_ the benefits before entering into new deals.

- a. Weighing up
- b. Swarming up
- c. Sagging off
- d. Speckling with

**Q.197** What is the **Synonym** of “BRISKLY”?

- a. Readily
- b. Rarely
- c. Brutally
- d. Senuously

**Q.198** What is the **Synonym** of “MOUNTING”?

- a. Contracting
- b. Clambering
- c. Descending
- d. Crumbling

**Q.199** What is the **Antonym** of “BASHFUL”?

- a. Brash
- b. Dash
- c. Trash
- d. Dank

**Q.200** What is the **antonym** of “SPECKLED WITH”?

- a. Commonplace
- b. Spick and Span
- c. Dappled
- d. Flawless